CIT 591 Introduction to Software Development

Module 8: HashMaps and Regular Expressions

Module Learning Objectives

- Use HashMaps to search for data stored as key/value pairs
- Find patterns in data using regular expressions

Module Glossary

- **HashMap:** A data structure used to conveniently represent data associations using key/value pairs.
- **`split` method:** An in-built method used for split a string into smaller portions called tokens. The tokens get stored in an array of Strings. This method is especially useful when dealing with comma-separated (or any other separator) data. Official documentation
- **Regular expressions (regex):** A sequence of characters that define a search pattern. There are many rules for regular expressions.
- **Wildcard:** A special character in a regular expression used to indicate any character/one or more characters etc.

Module Resources

- **Textbook Readings:**
  - 15.4: Maps
- **Websites:**
  - split Function (Java Documentation)
  - Download Sublime text editor
  - Relevant xkcd: Regular Expressions
  - More regular expressions rules
  - Online Java regex tester
  - Regular Expression Crossword Puzzles
  - HashMap Javadocs
  - Matcher Class Javadocs
  - Oracle Tutorial on Regular Expressions

Key Concepts & Examples

HashMaps: A HashMap is a data structure that associates keys to values, for example, mapping an identification number to an instance of a Person class. Use HashMaps when you are likely to need to retrieve information using keys/identifiers. The keys in a hashmap have to be unique. A HashMap has many useful methods such as put(), get() etc.

- Examples used in the video: MovieDataReader (retrieving information about a movie).

Regular Expressions: Regular expressions (also called **regex**) are used to find patterns in collections of text. They consist of a few key rules, for example, things like [a-z] mean *any character from 'a' through 'z'* etc. They can be used outside of Java as well although the syntax may vary depending on the programming language at hand To use regex in Java, you have to use the Matcher class and the Pattern class. Be sure to review the documentation to learn about how exceptions related to syntax errors in regular expressions can be handled.

- Examples used in the video: Patterns found in the names of countries first using Sublime Text and then in Java.

Hashmaps & Data Science (Intro to Assignment 5)

- Examples used in the video: Reading and analyzing weather data.